

Serial No.: 09/857,936

AMENDMENTS IN THE CLAIMS:

1. (Currently Amended) An optical semiconductor device comprising:
an active region; and
a p-doped cladding region disposed on one side of the active region;
wherein an electron-reflecting barrier is provided ~~on the p-side of~~ between the
cladding region and the active region for reflecting both Γ -electrons and X-electrons, ~~an~~
~~energy level of the Γ -conduction band of at least a part of the electron-reflecting barrier~~
~~being providing a greater potential barrier to Γ -electrons than an energy level of the Γ -~~
~~conduction band of the p-doped cladding region,~~
wherein the electron-reflecting barrier comprises a first electron-reflecting layer
for reflecting Γ -electrons and a second electron-reflecting layer for reflecting X-
electrons.

2. (Canceled)

3. (Original) A device according to claim 1, wherein at least one of the
electron-reflecting layers is a strained layer.

4. (Original) A device according to claim 3, wherein one of the electron-
reflecting layers is in a state of compressive strain and the other of the electron-
reflecting layers is in a state of tensile strain.

5. (Original) A device according to claim 1, wherein the device is a light-
emitting diode.

6. (Original) A device according to claim 1, wherein the device is a laser
device.

Serial No.: 09/857,936

7. (Original) A device according to claim 6, wherein the device is a separate confinement heterostructure laser device comprising an optical guiding region, the active region being disposed within the optical guiding region.

8. (Currently Amended) A device according to claim 7 1, wherein the layer for reflecting Γ -electrons is disposed between the optical guiding region and the layer for reflecting x-electrons.

9. (Original) A device according to claim 8, wherein the Γ -conduction band of the optical guiding region is substantially degenerate with the x-conduction band of the layer for reflecting Γ -electrons.

10. (Currently Amended) A device according to claim 2 1, wherein the layer for reflecting Γ -electrons is disposed between the layer for reflecting x-electrons and the p-doped cladding region.

11. (Original) A device according to claim 1, wherein the electron-reflecting barrier comprises a plurality of first electron-reflecting layers for reflecting Γ -electrons and a plurality of second electron-reflecting layers for reflecting x-electrons.

12. (Original) A device according to claim 11, wherein the electron-reflecting barrier is a superlattice structure.

13. (Currently Amended) A device according to claim 2 1, wherein the device is fabricated in the (Al, Ga, In)P system, the layer for reflecting Γ -electrons is made from a material selected from the group consisting of AlP and GaP, and the layer for reflecting x-electrons is made from InP.

14. (Original) A device according to claim 11, wherein the device is fabricated in the (Al, Ga, In)P system, each layer for reflecting Γ -electrons is made of a

Serial No.: 09/857,936

material selected from the group consisting of AlP and GaP, and the layer for reflecting x-electrons is made from InP.

15. (Original) A device according to claim 9, wherein the layer for reflecting Γ -electrons is AlP and the optical guiding region is $(\text{Al}_{0.3}\text{Ga}_{0.7})_{0.52}\text{In}_{0.48}\text{P}$.

16. (Original) A device according to claim 13, wherein the thickness of each of the electron-reflecting layers is 16Å or less.

17. (Original) A device according to claim 1, wherein at least one of the electron-reflecting layers is p-doped.

18. (Original) A device according to claim 13, wherein the first electron-reflecting layer contains indium.

19. (Original) A device according to claim 7, wherein the electron-reflecting barrier is disposed between the optical guiding region and the p-doped cladding region.

20. (Currently Amended) An optical semiconductor device comprising:
an optical guiding region;
an active region having at least one energy well, said active region being disposed in said optical guiding region; and
n-doped and p-doped cladding regions disposed on opposite sides of the optical guiding region;
wherein an electron-reflecting layer for reflecting Γ -electrons is provided ~~at the p-side of~~ between the p-doped cladding region and the active region; and
wherein the electron-reflecting layer contacts with the optical guiding region so that the Γ -conduction band of the optical guiding region is substantially degenerate with the X-conduction band of the electron-reflecting layer, and

Serial No.: 09/857,936

the electron-reflecting layer is formed of AlP.

21. (Currently Amended) A device according to claim 20, wherein the optical guiding region is formed of $(\text{Al}_{0.3}\text{Ga}_{0.7})_{0.52}\text{In}_{0.48}\text{P}$, and the electron-reflecting layer is formed of AlP.

22. (Original) A device according to claim 20, wherein the electron-reflecting layer is p-doped.

23. (Original) A device according to claim 20, wherein the electron-reflecting layer is disposed between the optical guiding region and the p-doped cladding region.

24. (Original) A device according to claim 20, wherein the device is a separate confinement heterostructure laser device.

25-28. (Previously Canceled)